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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/643,108	08/18/2003	Gadi Shor	5579/4	3328

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EXAMINER	
ETTEHADIEH, ASLAN	
ART UNIT	**PAPER NUMBER**
2611	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	01/16/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/643,108	SHOR ET AL.	
	Examiner	Art Unit	
	Aslan Ettehadieh	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 December 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-24* is/are pending in the application.

4a) Of the above claim(s) *8-11 and 18-24* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,6,7 and 12-17* is/are rejected.

7)☒ Claim(s) *5* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 February 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *4/20/2004*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of group I (claims 1 – 7 and 12 – 17) in the reply filed on 12/08/2006 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)). The requirement is still deemed proper and is therefore made FINAL.

2. Applicant's cancellation (due to election/restriction requirement) of claims 8 – 11 and 18 – 24 in the reply filed on 12/08/2006 is acknowledged. Claims 8 – 11 and 18 – 24 are now cancelled. Office action address claims 1 – 7 and 12 – 17.

Specification

3. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

Double Patenting

4. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct

from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

5. Claim 1 is provisionally rejected on the ground of nonstatutory double patenting over claims 1, 3 – 5, 11, 15 – 17 of copending Application No. 10/642886. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that

copending application since the referenced copending application and the instant application are claiming common subject matter, as follows:

6. Regarding claim 1, application 10/642886 discloses a method for transmitting information using ultra-wide band transmission, the method comprising:

allocating, for signal transmission, each of a plurality of frequency sub-bands (claims 1; 11); and

sending an ultra-wide band transmission comprising the information by transmitting a burst symbol cycle signal over each of the plurality of frequency sub-bands (claims 1, 3 – 5; 11, 15 – 17).

7. Claims 1 and 4 is provisionally rejected on the ground of nonstatutory double patenting over claims 29, 33, 36, 37 of copending Application No. 10/603372. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

The subject matter claimed in the instant application is fully disclosed in the referenced copending application and would be covered by any patent granted on that copending application since the referenced copending application and the instant application are claiming common subject matter, as follows:

8. Regarding claim 1, application 10/603372 discloses a method for transmitting information using ultra-wide band transmission, the method comprising:

allocating, for signal transmission, each of a plurality of frequency sub-bands (claim 29; dated amendment of 11/08/2006); and

sending an ultra-wide band transmission comprising the information by transmitting a burst symbol cycle signal over each of the plurality of frequency sub-bands (claim 29; dated amendment of 11/08/2006).

9. Regarding claim 4, application 10/603372 discloses switching off power to at least one circuit during OFF periods of a transmission to decrease power consumption (claims 29, 33, 36, 37; dated amendment of 11/08/2006).

Furthermore, there is no apparent reason why applicant would be prevented from presenting claims corresponding to those of the instant application in the other copending application. See *In re Schneller*, 397 F.2d 350, 158 USPQ 210 (CCPA 1968). See also MPEP § 804.

10. Claims 2 and 3 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 29, 30, 31 of U.S. Patent No. 10/603372. Although the conflicting claims are not identical, they are not patentably distinct from each other because sending more than one waveform over a single sub-band at a given time and sending a different waveform over each sub-band can be interpreted as sending at least two of the burst symbol cycles in parallel; where it is only a design choice on transmitting data, i.e. choices include serial or parallel transmission.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the

> applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

11. Claims 1 are rejected under 35 U.S.C. 102(e) as being anticipated by Aiello et al. (US 6952456; which discloses same inventors as applicant's admitted prior art of WO 01/99300).

12. Regarding claim 1, Aiello discloses a method for transmitting information using ultra-wide band transmission, the method comprising:

allocating, for signal transmission, each of a plurality of frequency sub-bands (col. 1 lines 53 – 55, col. 2 lines 8 – 10; where the channel being subdivided into a large number of non-overlapping frequency slots is being interpreted as frequency sub-bands); and

sending an ultra-wide band transmission comprising the information by transmitting a burst symbol cycle signal over each of the plurality of frequency sub-bands (col. 1 lines 53 – 55, col. 2 lines 8 – 10, col. 16 line 56 – col. 17 line 5, figure 9b element 236; where element 236 is being interpreted as a burst symbol cycle signal).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

13. Claims 2, 3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aiello et al. (US 6952456) in view of Ishida (US 5583915).

14. Regarding claims 2 and 3, Aiello does not expressly disclose at least two of the burst symbol cycle signals serially or in parallel.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use serial or parallel transmission, because they are two well know transmission methods. Applicant has not disclosed that at least two of the burst symbol cycle signals serially or in parallel provides an advantage, is used for a particular purpose or solves a stated problem.

In the same field of endeavor, however, Ishida discloses at least two of the burst symbol cycle signals serially or in parallel (col. 7 lines 10 – 24, figure 1).

Therefore it would have been obvious to one skilled in the art at the time of invention was made to use at least two of the burst symbol cycle signals serially or in parallel as taught by Ishida in the system of Aiello to provide for a diversity of transmission methods.

15. Claims 4, 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aiello et al. (US 6952456) in view of Adams et al. (US 6665339).

16. Regarding claim 4, Aiello does not expressly disclose switching off power to at least one circuit during OFF periods of a transmission to decrease power consumption.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to switching off power to at least one circuit during OFF periods of a transmission to decrease power consumption, because it is well known in the art turn off components or devices during period of non-use to save power.

In the same field of endeavor, however, Adams discloses switching off power to at least one circuit during OFF periods of a transmission to decrease power consumption (col. 1 lines 62 – 67).

Therefore it would have been obvious to one skilled in the art at the time of invention was made to use switching off power to at least one circuit during OFF periods of a transmission to decrease power consumption as taught by Adams in the system of Aiello to limit the power consumption (col. 1 line 62).

17. Regarding claim 7, Aiello further discloses utilizing at least one of an analog wave generator, digital wave generator, and a combination analog and digital wave generator (col. 1 lines 41 – 50, col. 3 lines 30 – 44, col. 11 line 62 – col. 12 line 67).

18. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Aiello et al. (US 6952456) in view of Adams et al. (US 6665339) in further view of Hirose (US 5598405).

19. Regarding claim 6, Aiello does not disclose maintaining signal frequency from an end of an ON period to a beginning of the following ON period.

In the same field of endeavor, however, Hirose discloses maintaining signal frequency from an end of an ON period to a beginning of the following ON period (abstract, col. 9 line 66 – col. 12 line 64).

Therefore it would have been obvious to one skilled in the art at the time of invention was made to use maintaining signal frequency from an end of an ON period to a beginning of the following ON period as taught by Hirose in the system of Aiello to the frequency of the oscillator is maintained (col. 7 lines 1 – 7).

20. Claims 12, 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aiello et al. (US 6952456) in view of Shattil (US 6888887).

21. Regarding claim 12, Aiello discloses a method for transmitting information using ultra-wide band transmission, the method comprising: allocating, for signal transmission, each of a plurality of frequency sub-bands (col. 1 lines 53 – 55, col. 2 lines 8 – 10; where the channel being subdivided into a large number of non-overlapping frequency slots is being interpreted as frequency sub-bands); and sending an ultra-wide band transmission comprising the information by transmitting a signal over each of the plurality of frequency sub-bands (col. 1 lines 53 – 55, col. 2 lines 8 – 10, col. 16 line 56 – col. 17 line 5, figure 9b element 236); dividing each of the frequency sub-bands into a plurality of segments; and cycling transmission between segments of each of the sub-bands (figure 3, col. 7 lines 32 – 58). Aiello does not disclose phase continuity is maintained.

In the same field of endeavor, however, Shattil discloses phase continuity is maintained (col. 16 lines 54 – 67).

Therefore it would have been obvious to one skilled in the art at the time of invention was made to use phase continuity is maintained as taught by Shattil in the system of Aiello to reduce narrowband interference (col. 16 line 67).

22. Regarding claim 13, Aiello discloses cycling transmission between segments of each of the frequency sub-bands (figure 3, col. 7 lines 32 – 58) and Shattil further discloses producing a signal of substantially uninterrupted phase (col. 16 lines 54 – 67).

23. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aiello et al. (US 6952456) in view of Fullerton (US 6430208; which discloses same inventors as applicant's admitted prior art of US 5960031).

24. Regarding claims 14 and 15, Aiello discloses a method for transmitting information using ultra-wide band transmission, the method comprising: allocating, for signal transmission, each of a plurality of frequency sub-bands (col. 1 lines 53 – 55, col. 2 lines 8 – 10; where the channel being subdivided into a large number of non-overlapping frequency slots is being interpreted as frequency sub-bands) and sending an ultra-wide band transmission comprising the information by transmitting a signal over each of the plurality of frequency sub-bands (col. 1 lines 53 – 55, col. 2 lines 8 – 10, col. 16 line 56 – col. 17 line 5, figure 9b element 236). Aiello does not disclose producing at least one analog carrier wave of a frequency sub-band using outputs from a plurality of digital to analog converters.

In the same field of endeavor, however, Fullerton discloses producing at least one analog carrier wave of a frequency sub-band using outputs from a plurality of digital to analog converters and wherein producing the at least one analog carrier wave comprises each of the digital to analog converters outputting a portion of the analog carrier wave based on an input bit, and comprises cycling through input values to produce consecutive segments of the analog carrier wave (figure 19, col. 17 lines 52 – 57, col. 18 lines 43 – 53, col. 25 lines 14 – 23, col. 3 lines 1 – 9, col. 13 lines 22 – 34).

Therefore it would have been obvious to one skilled in the art at the time of invention was made to use producing at least one analog carrier wave of a frequency

sub-band using outputs from a plurality of digital to analog converters as taught by Fullerton in the system of Aiello to bandwidth conservation.

25. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Aiello et al. (US 6952456) in view of Garg et al. (US 6535073).

26. Regarding claim 16, Aiello discloses a method for transmitting information using ultra-wide band transmission, the method comprising: allocating, for signal transmission, each of a plurality of frequency sub-bands (col. 1 lines 53 – 55, col. 2 lines 8 – 10; where the channel being subdivided into a large number of non-overlapping frequency slots is being interpreted as frequency sub-bands); and sending an ultra-wide band transmission comprising the information by transmitting a signal over each of the plurality of frequency sub-bands bands (col. 1 lines 53 – 55, col. 2 lines 8 – 10, col. 16 line 56 – col. 17 line 5, figure 9b element 236). Aiello does not disclose using a sine wave envelope to reduce side lobes in at least one carrier frequency, multiplying a signal by a sine wave of a lower frequency than the carrier frequency.

In the same field of endeavor, however, Garg discloses using a sine wave envelope to reduce side lobes in at least one carrier frequency, multiplying a signal by a sine wave of a lower frequency than the carrier frequency (col. 2 line 23 – col.3 line 9, figure 4; where the sine wave is of a lower frequency than the carrier wave because it is multiplied by the sine wave then up converted by mixers 26 to the higher carrier frequency).

Therefore it would have been obvious to one skilled in the art at the time of invention was made to use using a sine wave envelope to reduce side lobes in at least

one carrier frequency, multiplying a signal by a sine wave of a lower frequency than the carrier frequency as taught by Garg in the system of Aiello to reduce noise (col. 2 line 23 – col.3 line 9).

27. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Aiello et al. (US 6952456) in view of Garg et al. (US 6535073) in further view of Larrick, Jr. et al. (US 6690741).

28. Regarding claim 17, Aiello does not discloses varying pulse bandwidth while pulse repetition frequency remains constant, to facilitate control of signal spectrum characteristics and receiver selectivity.

In the same field of endeavor, however, Larrick discloses varying pulse bandwidth while pulse repetition frequency remains constant, to facilitate control of signal spectrum characteristics and receiver selectivity (abstract, col. 1 lines 33 – 34, col. 2 lines 49 – 67, col. 3 lines 7 – 30).

Therefore it would have been obvious to one skilled in the art at the time of invention was made to use varying pulse bandwidth while pulse repetition frequency remains constant, to facilitate control of signal spectrum characteristics and receiver selectivity as taught by Larrick in the system of Aiello to allow for controlled transmission (col. 1 lines 10 – 11).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

29. Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fullerton et al (US Patent No 6763057) in view of Larfick et al (US Patent No 6690741).

30. Regarding claim 1, Fullerton discloses a method for transmitting information using ultra-wide band transmission, the method comprising: allocating, for signal transmission, each of a plurality of frequency sub-bands (col. 6, lines 52-65; col. 16, lines 5-18; col. 12, line 59- col. 13, line 20); and sending an ultra-wide band transmission comprising the information by transmitting a burst symbol cycle signal over the plurality of frequency sub-bands (col. 7, lines 2-31; col. 13, lines 35-54, col. 11, lines 6-31, figs. 22-23).

However, Fullerton et al does not specifically disclose the steps of sending a signal over each of the plurality of sub-bands; wherein sending the signals comprises sending a different waveform over each sub-band; wherein each of the different waveforms is used to represent different information; wherein sending the signals comprises sending more than one waveform over a single sub-band at a given time.

On the other hand, Larrick from the same field of endeavor, discloses a data-modulated ultra wideband transmitter that modulates the phase, frequency, bandwidth, amplitude and/or attenuation of ultra-wideband pulses. The transmitter confines or band-limits UWB signals within spectral limits for use in communication (col. 3, lines 7-23; col. 3, lines 60-67). Furthermore, the center frequency, as well as the instantaneous phase, of the UWB signal can be controlled via oscillator control. This allows for frequency agile UWB emissions by simply changing the frequency of the oscillator

according to a desired hopping pattern. In addition, the instantaneous phase of the UWB pulse can be changed on a pulse-by-pulse basis to allow for various forms of phase modulation. Phase-locking the low-level impulse generator to the oscillator can generate a pulse-to-pulse coherent waveform. The combination of phase, frequency and amplitude modulations enable the generation of a wide class of UWB waveforms including UWB quadrature amplitude modulation (col. 6, lines 10-60; col. 7, lines 12-23). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply the technique of Larrick to the communication system of Fullerton in order to produce Ultra-wideband transmissions at well-controlled center frequencies and bandwidths extending to higher operating frequencies, and to allow for more efficient modulation techniques.

Allowable Subject Matter

31. Claim 5 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aslan Ettehadieh whose telephone number is (571) 272-8729. The examiner can normally be reached on Monday - Friday, 8:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mohammed Ghayour can be reached on (571) 272-3021. The fax phone

number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Aslan Ettehadieh
Examiner
Art Unit 2637

AE

KHAI TRAN
PRIMARY EXAMINER